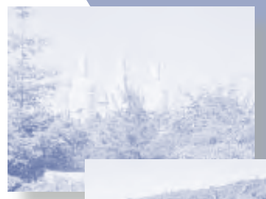
## A GOOD NEIGHBOR



King County is committed to protecting the water resources of the region and the health and well-being of our customers and future generations. We work to ensure safety and minimize impacts of all projects affecting the natural environment, wastewater facility neighbors and our employees.

At West Point, we have devoted extensive effort to odor and noise control and native landscaping to minimize the impact of the plant on the surrounding community and Discovery Park. We also created a publicly accessible wetland. Water reclamation, community improvement and active public involvement are other ways we work to make sure West Point is a good neighbor.

**Contact Us:**
West Point Treatment Plant
1400 West Utah Street
Seattle, WA 98199 206-263-3800

For **Treatment Plant Tours** or further information please call 206-296-8286 or 1-800-325-6165, ext. 68286, or see our Web site ***www.kingcounty.gov/wtd***

Alternative formats available

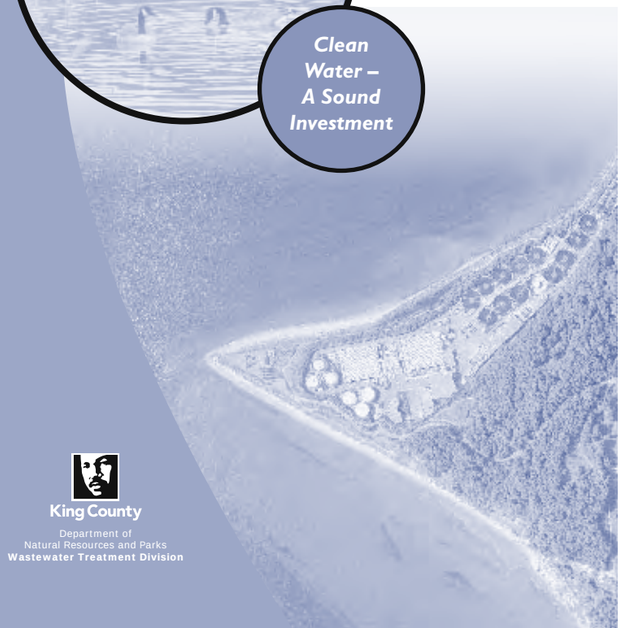
206-684-1280 or TTY Relay: 711


King County
Department of Natural Resources and Parks
**Wastewater Treatment Division**
201 S. Jackson Street, Suite 500
Seattle, WA 98104-3855
206-263-6028 or 1-800-325-6165, ext. 36028
*www.kingcounty.gov/wtd*


# WEST POINT TREATMENT PLANT

*Protecting Public Health and the Environment*

*Clean Water – A Sound Investment*




King County
Department of Natural Resources and Parks
**Wastewater Treatment Division**
0903westpointBRO.indd


For more than 40 years, the people of King County's Wastewater Treatment Division have been committed to protecting public health and the environment by transporting, treating and reclaiming wastewater and its byproducts. We work continually to improve and protect regional water quality.

**Lake Washington — the '50s**

**Lake Washington — fishable and swimmable today**

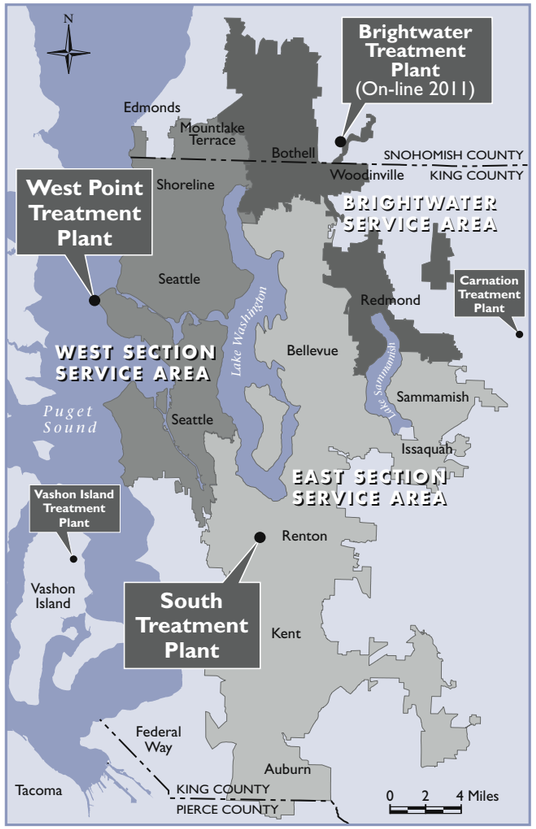
The **West Point Treatment Plant** is part of the regional wastewater treatment system that is funded by monthly sewer rates and serves more than 1.4 million people and covers 420 square miles. West Point cost-effectively treats wastewater and stormwater from homes, offices, schools, agencies, businesses and industries in Seattle, north King County, south Snohomish County, and some areas east of Lake Washington.

### THE PEOPLE OF WEST POINT — '24/7'

Thanks to about 150 dedicated employees, the West Point treatment system runs 24 hours a day, seven days a week. Trained professionals — operators, lab technicians, maintenance employees, process control personnel and administrative staff — ensure the West Point plant and the pipelines and pump stations that supply it with wastewater operate effectively. Our goal is to provide the region with the best wastewater treatment service available while operating as efficiently and effectively as possible.

*King county, working in your neighborhood to protect public health and the environment.*

## SERVICE AREA MAP




The **West Point Treatment Plant** is four miles north of downtown Seattle on 32 acres next to Puget Sound and Seattle's Discovery Park. Plant workers operate facilities for treating wastewater and stormwater, producing biosolids, reclaiming water, recovering energy, and testing new treatment technologies.

## WEST POINT 100 YEARS AGO…

In 1911, the City of Seattle built what is called the Fort Lawton Tunnel to discharge untreated wastewater from the city into Puget Sound at West Point. This wastewater included sewage from homes and businesses, stormwater from city streets, and litter and horse manure that washed into the pipes. Increased population and public concerns about water pollution resulted in the creation of a regional wastewater treatment system.

## HISTORY

**1958** — Construction of the West Point primary treatment plant was completed.

**1966** — Metro began an expansion of West Point to provide secondary treatment.

**1991** — King County voters created the Municipality of Metropolitan Seattle (Metro) to provide wastewater treatment and clean the waters of Lake Washington and Elliott Bay.

**1993** — Upgrade to secondary treatment was completed.

**1996** — Voters decided to merge Metro with King County, and King County assumed responsibility for West Point.

## MANAGING COMBINED SEWER SYSTEMS

A combined system is one in which stormwater and sewage are conveyed in the same pipeline to the treatment plant. The West Point service area is largely a combined system. As a result, West Point treats a lot of stormwater that would otherwise flow untreated into Puget Sound.


During heavy rains, the volume of flows to West Point can exceed the capacity of the conveyance system. Under these conditions, excessive combined flows may be released through permitted outfalls to protect public and private property and the county's facilities. These events are called combined sewer overflows, or CSOs. King County provides public notification when CSOs occur.

King County's CSO Control Program reports CSO events and develops plans and priorities to reduce the number of CSO events in the county's system. CSO events have been reduced significantly by control strategies including on-site primary treatment and storage facilities that retain flows until storms have passed. King County continues to work with state agencies to minimize the number of untreated discharges each year.

King County provides real time notification of CSO discharges at *http://www.kingcounty.gov/wtd*.

West Point continues to develop ways to improve operations and meet or exceed regulatory standards for effluent quality.

## REGULATION AND PERMITTING

Like most other treatment plants throughout the United States, West Point discharges treated wastewater every day into a local water body, Puget Sound. The 1972 federal Clean Water Act regulates "point" discharges of pollutants.

A National Pollution Discharge Elimination System Permit (available on our Web site) sets effluent standards and specifications for monitoring, treating and discharging treated wastewater through the West Point outfall in Puget Sound.

West Point has consistently been recognized by the National Association of Clean Water Agencies for excellence in wastewater treatment for our continued compliance with the NPDES permit.

Peak Performance AWARDS

## CONTROLLING WASTES AT THE SOURCE

Students touring the treatment plant learn about wastewater treatment and what they can do to keep harmful substances out of the waste stream.

Responsibilities of the Wastewater Treatment Division begin even before wastewater enters pipes and treatment plants. King County regulates business and industry to monitor and restrict the type and amount of waste that enters the system. We also work with the public to provide information about safe practices and alternatives. **Preventing contaminants from entering the sewer system is the easiest and least expensive way to protect people and the environment.** Extensive information is available on our Web site or by calling our division.

## DON'T FLUSH TROUBLE!

**Put used cleaning wipes, cloths and pads in the trash, NOT the toilet!**

The label might say "flushable", but disposable wipes are clogging our sewer lines and damaging pumps and other equipment.

Not only are these problems expensive to fix, they can also cause raw sewage overflows into homes, businesses and local waterways. So, think trash, not toilets!

## CREATING RESOURCES FROM WASTEWATER

West Point Treatment Plant's wastewater treatment facilities produce many valuable resources that can be used within the plant and throughout the region.

### WATER REUSE AND RECLAIMED WATER

Wastewater treated to secondary standards is reused on-site for cleaning and as a water source for the treatment process. Some of the treated water undergoes further treatment for use where potable water would otherwise be required saving hundreds of thousands of dollars in city water.

### ENERGY RECOVERY

Digester gas is a byproduct of the biosolids digestion process. It is a gas composed of methane and carbon dioxide produced by active anaerobic bacteria. West Point uses digester gas to power its raw sewage pump engines which require lots of power. In addition, the heat generated from the engines is recovered to heat the plant. Digester gas is also used to fire boilers which supply most of the plant's heat needs.

Composted biosolids make a wonderful soil amendment for gardens and commercial landscapes.

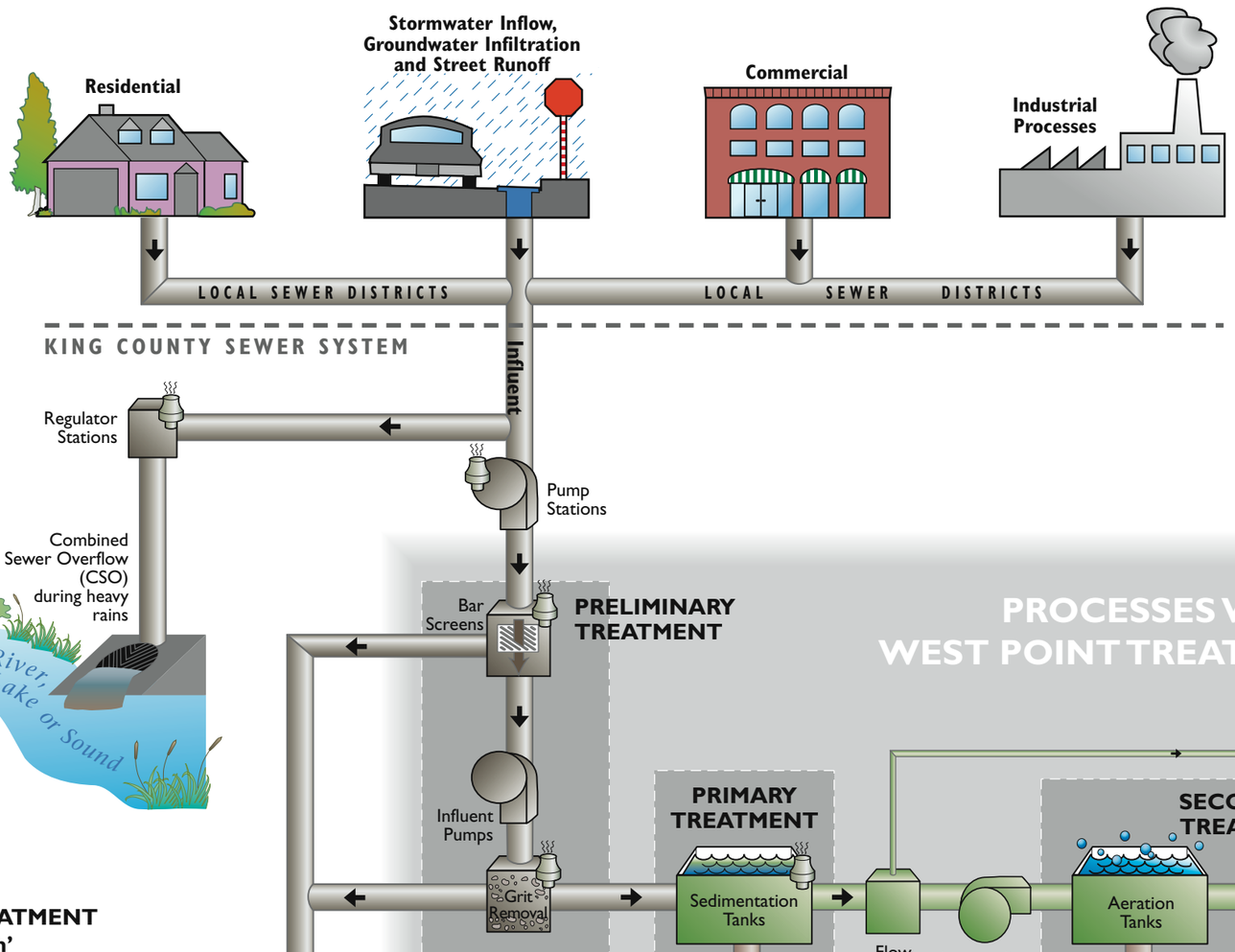
**BIOSOLIDS** Biosolids are the nutrient-rich organic product of treating wastewater. Biosolids provide organic matter that improves soil properties and enhances plant growth.

Some of West Point Treatment Plant's biosolids are sold as a soil amendment for agriculture in Eastern Washington. The rest is composted for use in landscaping and gardening.

King County
Department of Natural Resources and Parks
**Wastewater Treatment Division**
*www.kingcounty.gov/wtd*
206-684-1280

# WASTEWATER TREATMENT PROCESS

## How is wastewater treated at King County's West Point Treatment Plant?

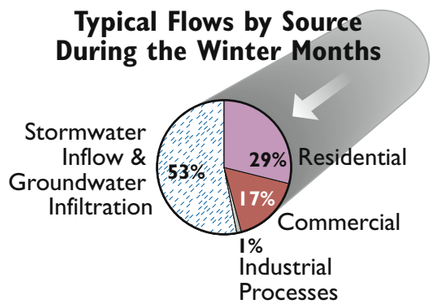



### PROCESSES WITHIN WEST POINT TREATMENT PLANT

**ODOR CONTROL – 'the Sniff Test'**
In order to minimize odors, we cover or contain the potentially smelly processes and collect the air for treatment.

### WHAT'S COMING INTO THE PLANT?

**Typical Flows by Source During the Winter Months**




### WEST POINT TREATMENT PLANT FACTS

**Design average wet weather flow:**
133 million gallons per day

**Design peak secondary capacity:**
300 million gallons per day

**Design maximum capacity:**
440 million gallons per day during peak storms

**Outfall pipe:** 3,600 feet long, 240 feet deep, 600-foot diffuser

**Reclaimed water produced:**
up to 220 million gallons per year

**Biosolids produced:**
about 50,000 wet tons per year

**Digester gas generated:**
550 million cubic feet per year

### PRELIMINARY TREATMENT 'Taking out the trash'

- Bar screens remove large debris like rags, paper, and leaves from wastewater (influent) as it enters West Point.
- After screening, wastewater is pumped into aerated grit chambers that remove sand and gravel.
- The trash and grit collected during this process are trucked to a landfill.

### PRIMARY TREATMENT a physical process 'Scum floats; sludge settles'

- Wastewater settles in long tanks called primary sedimentation tanks. Heavy organic material sinks to the bottom (as sludge), and light material (fats, oils and greases) floats to the top (as scum).
- Skimmers remove scum from the surface of the water and conveyor belts remove sludge from the tank bottom. Both are then sent onto the solids handling process.
- The treated water, now called primary effluent, flows to the secondary treatment process. Primary treatment removes approximately 60 percent of the organic solids.
- West Point's primary treatment system is designed to handle a peak combined flow of 440 million gallons a day (mgd).

### SECONDARY TREATMENT a biological process 'Friendly bugs eating contaminants'

- Primary effluent is pumped to aeration tanks where oxygen is added to encourage growth of useful bacteria naturally present in the wastewater.
- Bacteria eat suspended and dissolved organic material in the water. In the process, they produce more bacteria.
- The wastewater then goes to secondary clarifiers, large round sedimentation tanks where bacteria settle to the bottom of the tank as secondary sludge.
- Most (90 percent) of secondary sludge goes back to the aeration tanks to keep a healthy bacteria population going; the rest goes to the solids handling process.
- The remaining water — secondary effluent — leaves the clarifiers at least 85 percent cleaner, typically close to 95 percent, than when it entered West Point.

### DISINFECTION 'Zapping pathogens'

- Secondary effluent is chlorinated, destroying most remaining pathogens, or disease-causing bacteria.
- To protect the receiving water environment, the final effluent is dechlorinated before it is released through an outfall pipe and diffuser into Puget Sound.

### RECLAIMED WATER 'Saving $H_20$'

- After disinfection, some secondary effluent undergoes advanced treatment (coagulation, filtration, disinfection) to reduce use of water for irrigation and some plant processes.

### SOLIDS HANDLING

**Creating biosolids and energy, 'Blend, thicken, digest, dewater'**

- Organic solids — primary and secondary scum and sludge from the sedimentation and clarifier tanks — are blended and thickened in a gravity-belt thickening process. The solids are then pumped to digester tanks where anaerobic bacteria at 98 degrees Fahrenheit break down organic material and kill pathogens. The activity of the bacteria creates digester gas and reduces the solids mass by 50 percent.
- The digested solids are then pumped from digesters to equipment that uses centrifuges to remove excess water from the solids.
- The resulting dewatered solid material is nutrient-rich biosolids, safe for use as a soil amendment.
- West Point Treatment Plant has been nationally recognized for its environmental management system and commitment to continual improvement.


King County
Department of Natural Resources and Parks
**Wastewater Treatment Division**
*www.kingcounty.gov/wtd*
206-684-1280